

US-PAT-NO: 6525741
DOCUMENT-IDENTIFIER: US 6525741 B1
TITLE: Chroma key of antialiased
images
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INVENTOR-INFORMATION:

NAME	STATE	ZIP CODE	CITY	COUNTRY
Klassen; R. Victor	NY	N/A	Webster	N/A
Harrington; Steven J.	NY	N/A	Webster	N/A

US-CL-CURRENT: 345/589, 345/591 , 345/592 ,
345/614 , 345/640 , 345/660
382/199 , 382/299 , 348/584 , 348/586 , 348/592 ,

ABSTRACT:

A method of combining a foreground image and a background image includes scaling up a pixel of interest, which is positioned along an edge between a subject and a key colored backing, into a plurality of edge subpixels. The pixel of interest is included in a digital antialiased foreground image. A corresponding pixel of a digital background scene is also scaled up. The corresponding pixel is associated with the pixel of interest and is scaled up into a plurality of background subpixels. For each

of the edge subpixels, if a color of the edge subpixel matches the key colored backing, a respective new color of the edge subpixel is determined as a function of one of the background subpixels, which is associated with the edge subpixel. Also, the new color is stored to the edge subpixel. After all the subpixels have been evaluated, the edge subpixels are scaled down to a new pixel of interest.

20 Claims, 5 Drawing figures

Exemplary Claim Number: 1

Number of Drawing Sheets: 3

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Abstract Text - ABTX (1):

A method of combining a foreground image and a background image includes scaling up a pixel of interest, which is positioned along an edge between a subject and a key colored backing, into a plurality of edge subpixels. The pixel of interest is included in a digital antialiased foreground image. A corresponding pixel of a digital background scene is also scaled up. The corresponding pixel is associated with the pixel of interest and is scaled up into a plurality of background subpixels. For each of the edge subpixels, if a color of the edge subpixel matches the key colored backing, a respective new

color of the edge subpixel is determined as a function of one of the background subpixels, which is associated with the edge subpixel. Also, the new color is stored to the edge subpixel. After all the subpixels have been evaluated, the edge subpixels are scaled down to a new pixel of interest.

Brief Summary Text - BSTX (11):

A foreground scene is composited with a background scene by evaluating each of a plurality of foreground pixels in the foreground scene. For each of the foreground pixels, a determination is made if the foreground pixel is included within an edge between a subject and a backing in the foreground scene. The backing includes a key color. If the foreground pixel is included within the edge, the foreground pixel is scaled up into a plurality of foreground subpixels. A background pixel, at a corresponding location in the background scene, is scaled up into a plurality of background subpixels. A determination is made, for each of the foreground subpixels, if a color of the foreground subpixel matches the key color. If the foreground subpixel matches the key color, the foreground subpixel is replaced with a corresponding background subpixel. After determining if each of the foreground subpixels matches the key color, the foreground subpixels are scaled down to a corresponding new foreground pixel.

Detailed Description Text - DETX (11):

If the foreground image 10 is antialiased, a better composite picture is obtained along the edge 22 by scaling up pixels corresponding to the edge 22 in both images 10, 18 before the replacement is made. Then, for those regions in the foreground image 10 that include the edge 22, it is determined which subpixels in the foreground image 10 are to be preserved and which are to be replaced by corresponding subpixels in the background image 18. Importantly, the replacement is performed for the scaled up pixels.

Claims Text - CLTX (1):

1. A method of compositing a foreground scene and a background scene, comprising: evaluating each of a plurality of foreground pixels in the foreground scene; for each of the foreground pixels, determining if the foreground pixel is included within an edge between a subject and a backing in the foreground scene, the backing including a key color; and if the foreground pixel is included within the edge: scaling up the foreground pixel into a plurality of foreground subpixels; scaling up a background pixel, at a corresponding location in the background scene, into a plurality of background subpixels; for each of the foreground subpixels, determining if a color of the foreground subpixel matches the key color; if the

foreground subpixel matches the key color, replacing the foreground subpixel with a corresponding background subpixel; and after determining if each of the foreground subpixels matches the key color, scaling down the foreground subpixels to a corresponding new foreground pixel.

Claims Text - CLTX (8):

8. A method of combining a foreground image and a background image, comprising: scaling up a pixel of interest, positioned along an edge between a subject and a key colored backing, into a plurality of edge subpixels, the pixel of interest being included in a digital antialiased foreground image; scaling up a corresponding pixel of a digital background scene, the corresponding pixel being associated with the pixel of interest and being scaled up into a plurality of background subpixels; for each of the edge subpixels, if a color of the edge subpixel matches the key colored backing: determining a respective new color of the edge subpixel as a function of one of the background subpixels, the background subpixel being associated with the edge subpixel; and storing the new color to the edge subpixel; and scaling down the edge subpixels to a new pixel of interest.

Claims Text - CLTX (12):

12. The method of combining a foreground image and a background image as

set forth in claim 8, further including:
associating the background subpixel
with the edge subpixel as a function of the
respective locations of the
subpixels within the plurality of subpixels.

Claims Text - CLTX (16):

16. A system for compositing images,
comprising: a memory device for
storing a background image and a foreground image,
including a subject and a
backing having a key color, an edge being defined
between the subject and the
backing; and a central processing unit ("CPU")
receiving the foreground and
background images from the memory device, the CPU
evaluating each of a
plurality of foreground pixels in the foreground
image and determining if the
foreground pixel is included within the edge, if
the foreground pixel is
included within the edge, the CPU scaling up the
foreground pixel into a
plurality of foreground subpixels and scaling up a
background pixel, at a
corresponding location in the background scene,
into a plurality of background
subpixels, the CPU determining, for each of the
foreground subpixels, if a
color of the foreground subpixel matches the key
color, if the foreground
subpixel matches the key color, the CPU replacing
the foreground subpixel with
a corresponding background subpixel, and after
determining if each of the
foreground subpixels matches the key color, the CPU
scaling down the foreground
subpixels to a corresponding new foreground pixel.